

WHAT IS CLAIMED IS:

1                   1.       A method for alerting the pilot of an aircraft to a potentially hazardous  
2 condition comprising the steps of:  
3                   estimating a deceleration required to stop the aircraft on a runway of intended  
4 landing;  
5                   comparing said deceleration to a maximum deceleration of the aircraft; and  
6                   asserting an alert signal when said deceleration is greater than said maximum  
7 deceleration.

1                   2.       The method of claim 1 wherein said step of estimating deceleration  
2 further includes the step of including a gain factor in said deceleration to account for at least  
3 one of a plurality of runway surface conditions.

1                   3.       The method of claim 1 wherein said step of estimating deceleration  
2 further includes the step of including a gain factor in said deceleration to account for at least  
3 one atmospheric condition.

1                   4.       The method of claim 1 wherein said step of asserting an alert signal  
2 includes the step of commanding an autopilot go-around manoeuvre.

1                   5.       A method for alerting the pilot of an aircraft to a potential go-around  
2 condition comprising the steps of:  
3                   monitoring a plurality of parameters indicative of an unstabilized approach;  
4                   assigning a risk of go-around value according to each of said parameters; and  
5                   asserting an alert signal when said value exceeds a predetermined threshold  
6 amount.

1                   6.       The method of claim 5 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a change in a speed of the aircraft.

1                   7.       The method of claim 5 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a runway wind condition.

1                   8.     The method of claim 5 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a flight path angle of the aircraft.

1                   9.     The method of claim 5 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a position of the aircraft.

1                   10.    The method of claim 5 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a track of the aircraft.

1                   11.    The method of claim 5 wherein said step of asserting an alert signal  
2 comprises the step of commanding an autopilot go-around manoeuvre.

1                   12.    The method of claim 5 wherein said step of asserting an alert signal  
2 further comprises the steps of:  
3                   asserting a go-around caution alert signal when said value exceeds a first  
4 threshold amount and is less than a second threshold amount; and  
5                   asserting a go-around warning signal when said value exceeds said second  
6 threshold amount.

1                   13.    A method of alerting the pilot of an aircraft to a potential go-around  
2 condition comprising the steps of:  
3                   monitoring a plurality of parameters indicative of a runway landing length  
4 required;  
5                   assigning a risk of runway overrun value based on said plurality of parameters;  
6 and  
7                   asserting an alert signal when said risk value exceeds a predetermined  
8 threshold value.

1                   14.    The method of claim 13 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a deceleration required to stop the aircraft.

1                   15.     The method of claim 13 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring a runway surface condition.

1                   16.     The method of claim 13 wherein said step of monitoring a plurality of  
2 parameters includes the step of monitoring at least one atmospheric condition.

1                   17.     The method of claim 13 wherein said step of asserting an alert signal  
2 further comprises the steps of:

3                   asserting a go-around caution alert signal when said value exceeds a first  
4 threshold amount and is less than a second threshold amount; and

5                   asserting a go-around warning signal when said value exceeds said second  
6 threshold amount.

1                   18.     The method of claim 13 wherein said step of asserting an alert signal  
2 comprises the step of commanding an autopilot go-around manoeuvre.

1                   19.     A computer program product for alerting the pilot of an aircraft to a  
2 potentially hazardous condition comprising:

3                   a computer readable storage medium having computer readable program code  
4 means embodied in said medium, said computer readable program code means having:

5                   a first computer instruction means for estimating a deceleration required to  
6 stop the aircraft on a runway of intended landing;

7                   a second computer instruction means for comparing said deceleration to a  
8 maximum deceleration of the aircraft; and

9                   a third computer instruction means for asserting an alert signal when said  
10 deceleration is greater than said maximum deceleration.

1                   20.     The computer program product of claim 19 further including a fourth  
2 instruction means for asserting an autopilot go-around command when said alert signal is  
3 asserted.

1                   21.     A computer program product for alerting the pilot of an aircraft to a  
2 potential go-around condition comprising:

3 a computer readable storage medium having computer readable program code  
4 means embodied in said medium, said computer readable program code means having:  
5 a first computer instruction means for accessing and monitoring a plurality of  
6 parameters indicative of an unstabilized approach;  
7 a second computer instruction means for assigning a risk of go-around value  
8 according to each of said parameters; and  
9 a third computer instruction means for asserting an alert signal when said  
10 value exceeds a predetermined threshold amount.

1 22. The computer program product of claim 21 further comprising a fourth  
2 instruction means for asserting an autopilot go-around command when said alert signal is  
3 asserted.

1 23. A computer program product for alerting the pilot of an aircraft to a  
2 potential go around condition comprising:  
3 a computer readable storage medium having computer readable program code  
4 means embodied in said medium, said computer readable program code means having:  
5 a first computer instruction means for accessing and monitoring a plurality of  
6 parameters indicative of a runway landing length required;  
7 a second computer instruction means for assigning a risk of runway overrun  
8 value based on said plurality of parameters; and  
9 a third computer instruction means for asserting an alert signal when said risk  
10 value exceeds a predetermined threshold value.

1 24. The computer program product of claim 23 further including a fourth  
2 computer instruction means for asserting an autopilot go-around command when said alert  
3 signal is asserted.

1 25. An apparatus for alerting the pilot of an aircraft to a potential go-  
2 around condition comprising:  
3 an input coupled to receive a plurality of parameters useful as indicators of an  
4 unstabilized approach;  
5 an output; and

6 a signal processing device, coupled to said input, and to said output for:  
7 assigning a risk of go-around value according to each of said parameters; and  
8 asserting an alert signal when said value exceeds a predetermined threshold  
9 amount.

1 26. The apparatus of claim 25 wherein said apparatus comprises an  
2 Enhanced Ground Proximity Warning computer.

1 27. The apparatus of claim 25 wherein said alert signal further includes  
2 signals useful for driving a display.

1 28. The apparatus of claim 25 wherein said alert signal further includes an  
2 aural alert signal.

1 29. The apparatus of claim 25 wherein said parameters include a change in  
2 a speed of the aircraft.

1 30. The apparatus of claim 25 wherein said parameters include a runway  
2 wind condition.

1 31. The apparatus of claim 25 wherein said parameters include a flight  
2 path angle of the aircraft.

1 32. The apparatus of claim 25 wherein said parameters include a position  
2 of the aircraft.

1 33. The apparatus of claim 25 wherein said parameters include a track of  
2 the aircraft.

1 34. The apparatus of claim 25 wherein said alert signal comprises an  
2 autopilot go-around manoeuvre command.

1 35. The apparatus of claim 25 further including a database of runway data.

1 36. The apparatus of claim 25 wherein said parameters include runway  
2 data.

1 37. The apparatus of claim 25 wherein said parameters include terrain  
2 data.

1 38. An apparatus for alerting the pilot of an aircraft to a potential go-  
2 around condition comprising:  
3 an input coupled to receive a plurality of parameters useful as indicative of a  
4 runway landing length required;  
5 an output; and  
6 a signal processing device, coupled to said input and to said output, for:  
7 assigning a risk of runway overrun value based on said plurality of  
8 parameters; and  
9 asserting an alert signal when said risk value exceeds a predetermined  
10 threshold value.

1 39. The apparatus of claim 38 wherein said parameters include a  
2 deceleration required to stop the aircraft.

1 40. The apparatus of claim 38 wherein said parameters include a runway  
2 surface condition.

1 41. The apparatus of claim 38 wherein said parameters include at least one  
2 atmospheric condition.

1 42. The apparatus of claim 38 wherein said apparatus comprises an  
2 Enhanced Ground Proximity Warning computer.

1 43. The apparatus of claim 38 wherein said alert signal further includes  
2 signals useful for driving a display.

1 44. The apparatus of claim 38 wherein said alert signal further includes an  
2 aural alert signal.

1 45. The apparatus of claim 38 wherein said alert signal comprises an  
2 autopilot go-around manoeuvre command.

1 46. The apparatus of claim 38 further including a database of runway data.

1 47. The apparatus of claim 38 wherein said parameters include runway  
2 data.

1 48. The apparatus of claim 38 wherein said parameters include terrain  
2 data.

1 49. An apparatus for alerting the pilot of an aircraft to a potentially  
2 hazardous condition comprising:  
3 an input coupled to receive runway data and at least one aircraft performance  
4 data;  
5 an output; and  
6 a signal processing device coupled to said input and to said output for:  
7 estimating a deceleration required to stop the aircraft on a runway of  
8 intended landing;  
9 comparing said deceleration to a maximum deceleration of the aircraft;  
10 and  
11 asserting an alert signal when said deceleration is greater than said  
12 maximum deceleration.

1                    50.    The apparatus of claim 49 wherein said runway data includes at least  
2 one runway surface condition.

1                    51.    The apparatus of claim 49 wherein said input is further coupled to  
2 receive at least one atmospheric condition.

1                    52.    The apparatus of claim 49 wherein said input is further coupled to  
2 receive a runway end point data.

1                    53.    The apparatus of claim 49 wherein said alert signal includes an  
2 autopilot go-around manoeuvre command.

1                    54.    The apparatus of claim 49 wherein said alert signal further includes  
2 signals useful for driving a display.

1                    55.    The apparatus of claim 49 wherein said alert signal further includes an  
2 aural alert signal.

1                    56.    The apparatus of claim 49 further including a database of runway data.

1                    57.    The apparatus of claim 49 wherein said apparatus comprises an  
2 Enhanced Ground Proximity Warning computer.

1                    58.    The apparatus of claim 56 wherein said database further includes  
2 terrain data.

1                    59.    The apparatus of claim 46 wherein said database further includes  
2 terrain data.